

Magnavox

SERVICE MANUAL

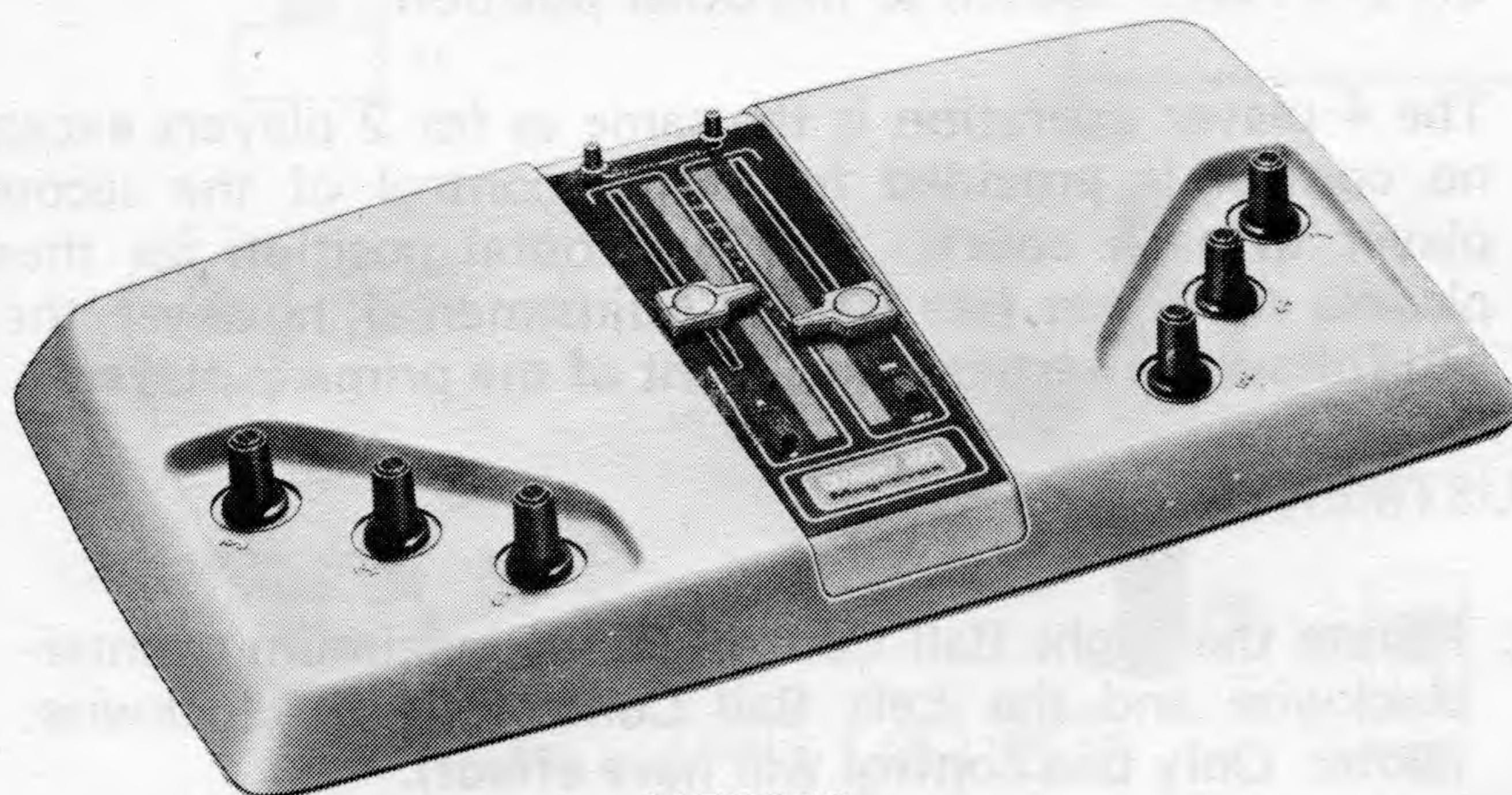
THE MAGNAVOX COMPANY • SERVICE DEPARTMENT
FORT WAYNE, INDIANA

Manual No. 6503

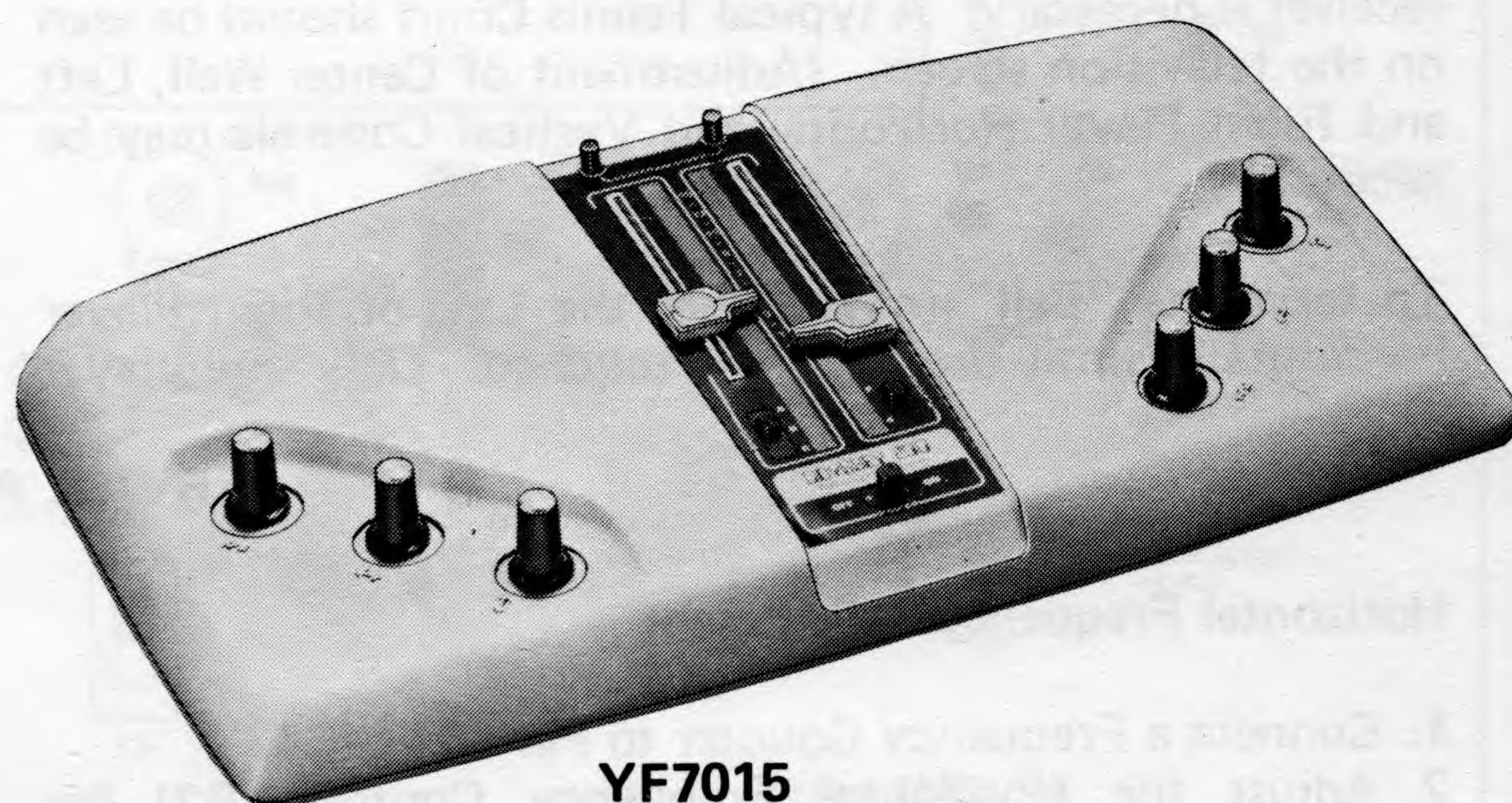
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YF7010 & YF7015 ODYSSEY



YF7010



YF7015

GENERAL INFORMATION

The YF7010 and YF7015 can be powered by either 6 "C" cells or an optional AC to DC 9 volt adapter. The basic operation of these units are the same, however, the features differ slightly.

The YF7015 has three games, electronic and mechanical

scoring, and the option of two or four players with Tennis and Hockey.

The YF7010 has two games, mechanical scoring, and two players.

SPECIFICATIONS

| | Minimum | Nominal | Maximum |
|--|------------|------------|------------|
| Regulated Voltage Supply Measured at Pin 3 of IC1 | 4.5V | 5.0V | 5.5V |
| Current Drain YF7010 | ---- | 45 Ma | ---- |
| YF7015 | ---- | 65 Ma | ---- |
| Vertical Sync Frequency | 59 Hz | 60 Hz | 61 Hz |
| Pulse Amplitude | 3.5V | ---- | ---- |
| Pulse Width | 180 usec | 210 usec | 250 usec |
| Horizontal Sync Frequency | 15.704 KHz | 15.734 KHz | 15.784 KHz |
| Pulse Amplitude | 3.5V | ---- | ---- |
| Pulse Width | 4.0 usec | ---- | 7.0 usec |
| RF Carrier Frequency Channel 3 | 61.22 MHz | 61.25 MHz | 61.28 MHz |
| Channel 4 | 67.22 MHz | 67.25 MHz | 67.28 MHz |
| RF Output Into 300 ohms | 1100 uv | ---- | 1600 uv |

TYPICAL OPERATION (TENNIS)

Connect the 300 ohm twin lead from the Antenna/Game switch to the 300 ohm antenna terminals of a properly adjusted and operating television receiver. Connect the game cord cable from the Odyssey unit to the Antenna/Game Switch and place the Game/TV Switch in the "Game" position.

Place the Channel Switch on the Odyssey to either Channel 3 or 4 and the television VHF Channel Selector to the same channel. (The Channel Switch on the Odyssey is located to the right of the battery compartment).

Place the Power Switch in the "On" position, the Game Switch to Game "B" (Tennis), and fine tune the television receiver if necessary. A typical Tennis Court should be seen on the television screen. (Adjustment of Center Wall, Left and Right Player Horizontal and Vertical Controls may be necessary).

To serve the "Ball" move either the Left or Right Player horizontally until the "Net" is touched. Only one player

will cause the "Ball" to be served.

The game is then played by each opponent operating the Vertical Player, Horizontal Player, and Ball Control for his side of the court. A rebound circuit keeps the "Ball" from going off of the top and bottom of the screen.

If the YF7015 is being used Electronic Scoring Marks will appear in the lower left area of the television screen. These marks will move horizontally to the right each time a point is made indicating which player is ahead. The top mark represents the player in the right court and the bottom mark the left player. After 15 points have been scored the winners mark will disappear. To reset the score marks place the 2/4 Player Switch to the other position.

The 4 player operation is the same as for 2 players except no control is provided for direct control of the second player in each court. The horizontal position for these players are preset (see Service Adjustments), however, they will follow the vertical movement of the primary player.

SERVICE ADJUSTMENTS

Horizontal Frequency Adjustment

1. Connect a Frequency Counter to Pin 16 of IC1.
2. Adjust the Horizontal Frequency Control (R2) for 15,734 Hz + or - 30 Hz.

Vertical Frequency Adjustment

1. Connect a Frequency Counter to Pin 14 of IC1.
2. Adjust the Vertical Frequency Control (R4) for 60 Hz + or - 1 Hz.

Blanking Width & Centering Adjustment

1. Connect an oscilloscope to the Composite Video Output at Pin 5 of IC5.
2. Apply +3 VDC bias to Pin 8 of IC5.
3. Adjust the Blanking Width Control (R70) for 16 usec. width (see Figure 1).
4. Adjust the Blanking Centering Control (R71) for 6 usec before horizontal sync (see Figure 1).

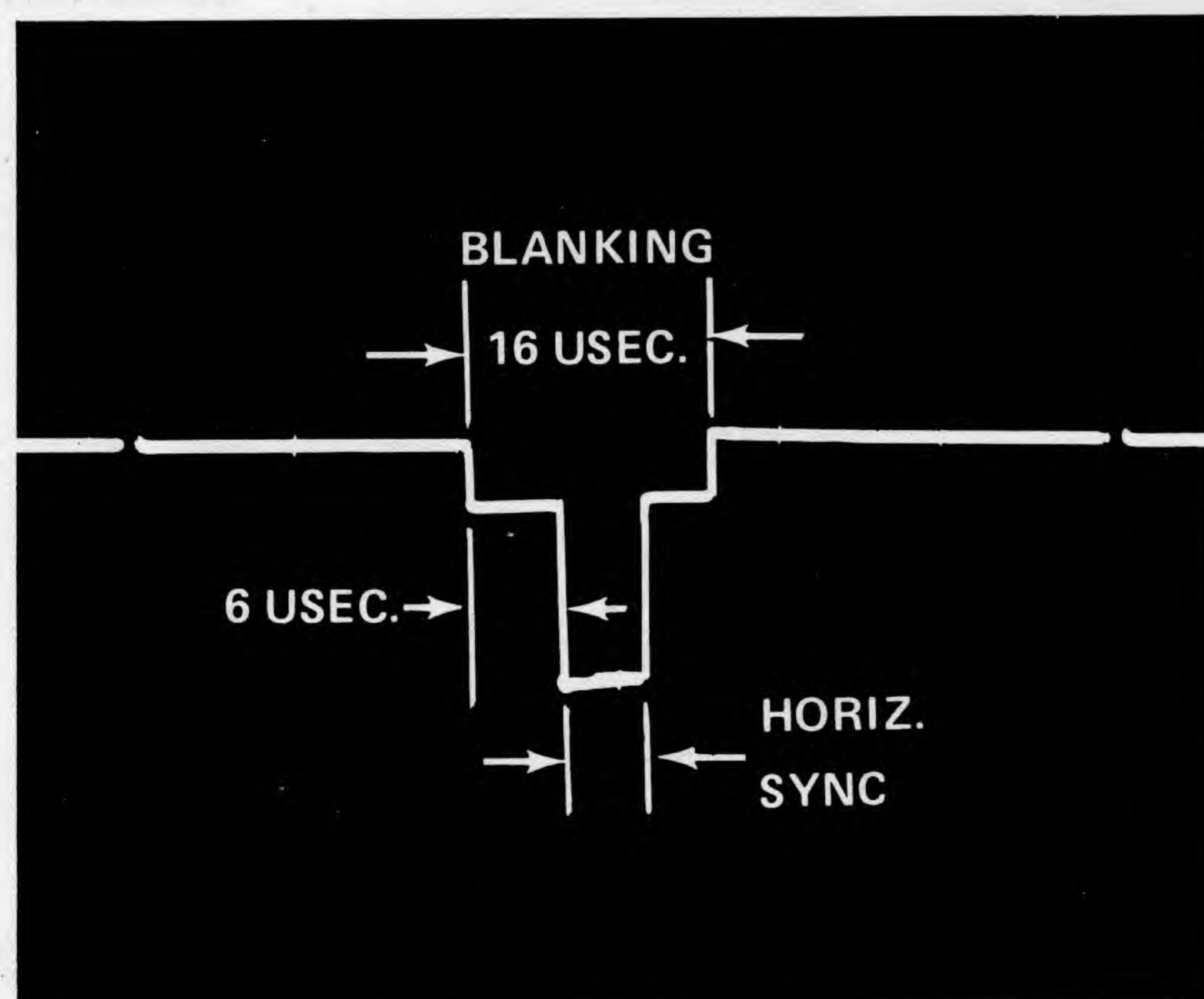


FIGURE 1

Top & Bottom Rebound Adjustment

1. Connect +3 VDC bias to Pin 3 of IC3.

2. Rotate the Right Ball Control (R74) maximum counter-clockwise and the Left Ball Control (R75) clockwise. (Note: Only one control will have effect).
3. Adjust the Lower Rebound Control (R10) until the entire "Ball" is visible at the bottom of the screen.
4. Turn the Right Ball Control (R74) maximum clockwise and the Left Ball Control (R75) maximum counter-clockwise.
5. Adjust the Upper Rebound Control (R9) until the entire "Ball" is visible at the top of the screen.

Note: Place the Game Switch to "C" (Hockey) and the Players switch to "4" for the following adjustments.

Right Wall Horizontal Position

1. Adjust the Right Wall Horizontal Control (R6) until the Right Wall is as close as possible to the right side of the screen and still fully visible.

Goal Opening Position

1. Adjust the Goal Opening Control (R14) until the goal openings in both walls are centered vertically.

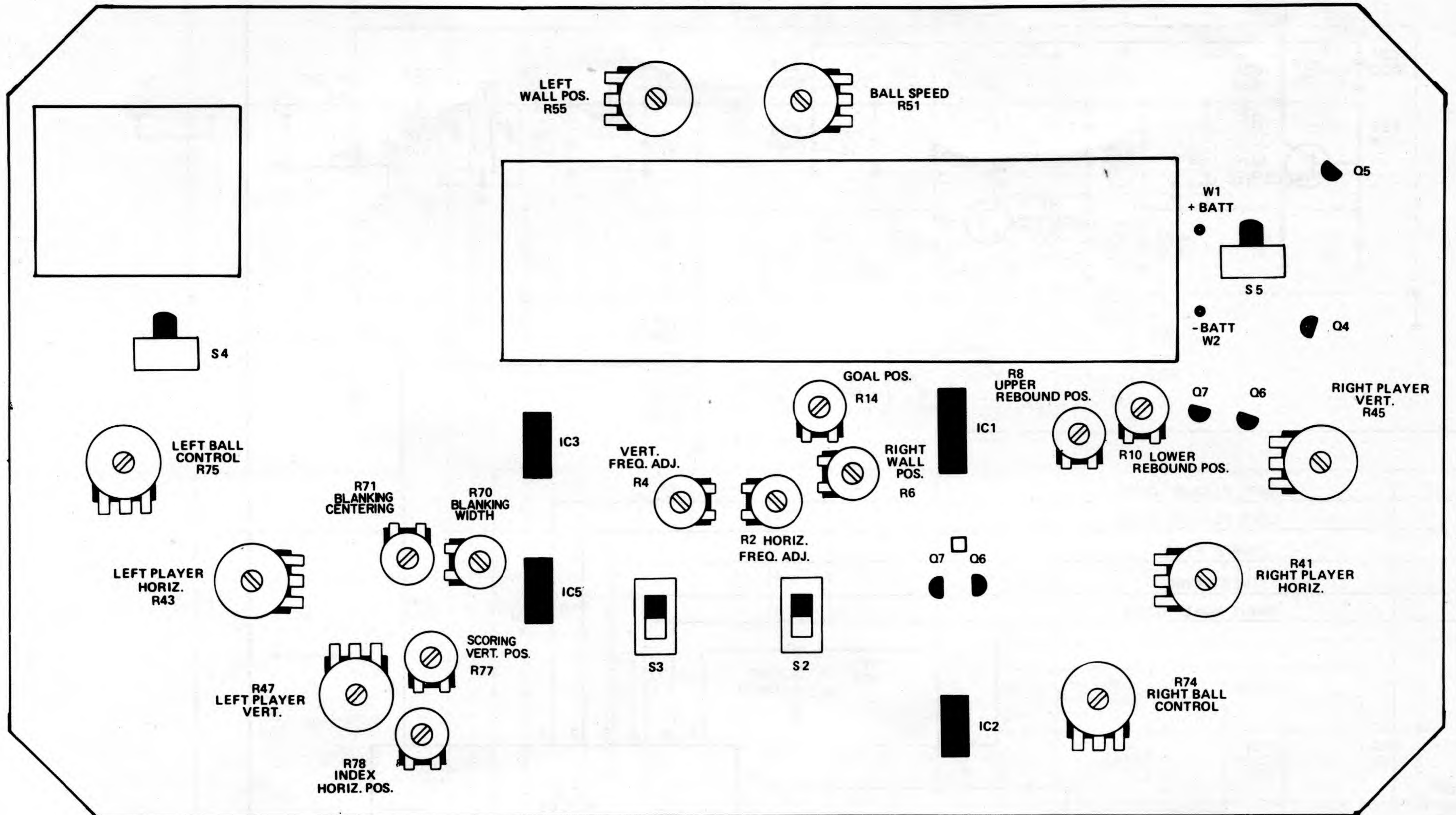
Score Indicator Position

1. Adjust the Horizontal Score Control (R78) until the indicators are approximately 1" to the right of the Left Hockey Wall.
2. Adjust the Vertical Score Control (R77) until the lowest part of the score indicator is approximately 1½" from the bottom of the screen.

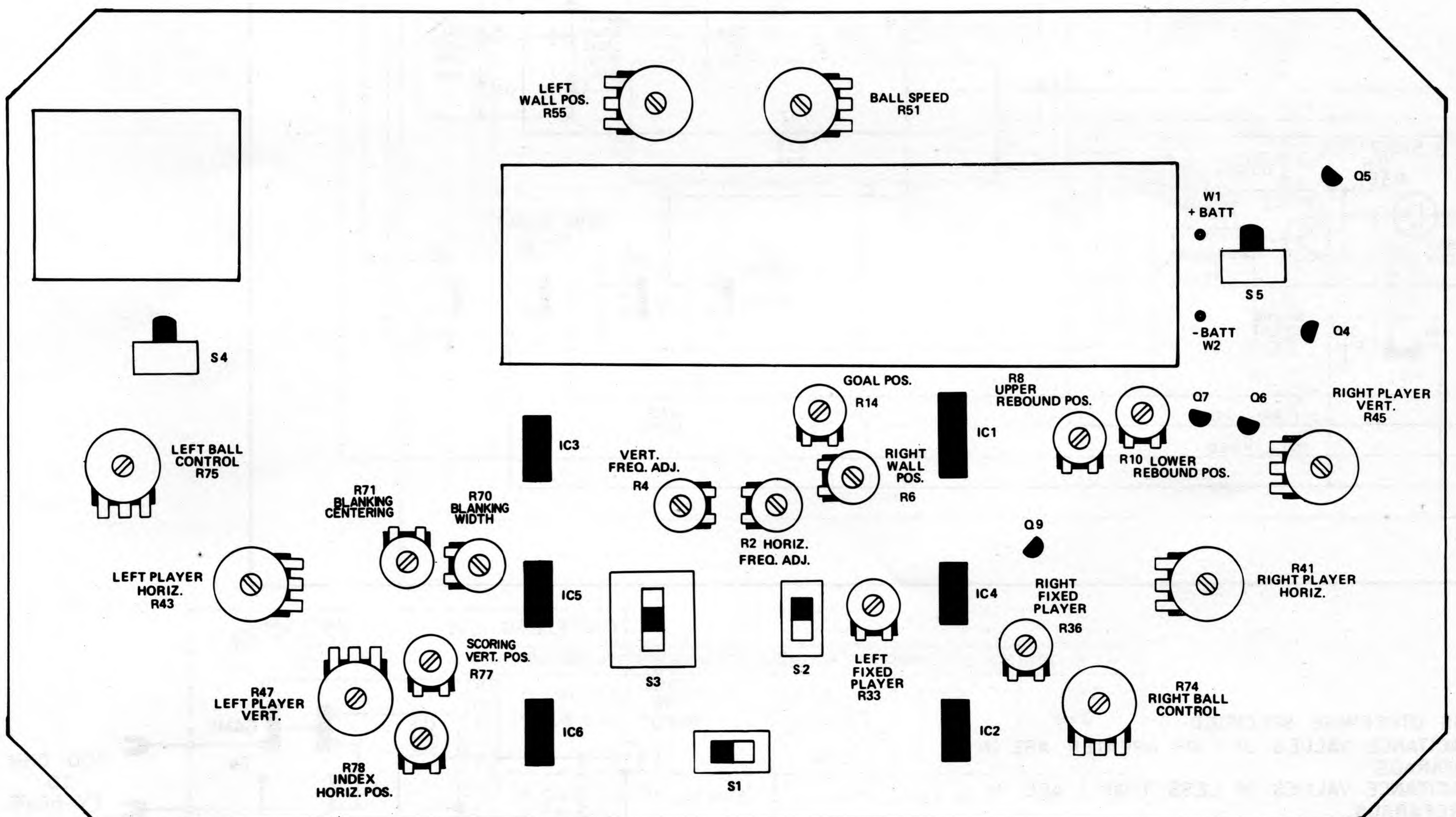
Right & Left Fixed Player Adjustment

1. Adjust the Left Fixed Player Horizontal Control (R33) until the player is approximately its width to the right of the left wall.
2. Adjust the Right Fixed Player Horizontal Control (R36) until the player is approximately its width to the left of the left wall.

YF7010 TOP VIEW


☐ EARLY PRODUCTION LOCATIONS

YF7015 TOP VIEW



YF7010 & YF7015 VOLTAGE CHARTS

| IC1 | | |
|-----|--------------|------|
| PIN | VOLTAGE | NOTE |
| 1 | 0V | ---- |
| 2 | 4.4V | ---- |
| 3 | 5.2V | ---- |
| 4 | 0V | ---- |
| 5 | 2.7V | ---- |
| 6 | .9V to 1.3V | 4 |
| 7 | 2.1V to 2.7V | 5 |
| 8 | 0V | ---- |
| 9 | .08V | ---- |
| 10 | 4.7V | ---- |
| 11 | 1V | ---- |
| 12 | 2.4V | ---- |
| 13 | 2V to 4.5V | 7 |
| 14 | .10V | ---- |
| 15 | 5.2V | ---- |
| 16 | .40V | ---- |
| 17 | 3.0V | ---- |
| 18 | 2.1V | ---- |

| IC2 | | |
|-----|--------------|------|
| PIN | VOLTAGE | NOTE |
| 1 | .4V | ---- |
| 2 | 5.2V | ---- |
| 3 | 1.7V to 3.1V | 8 |
| 4 | 2.0V | ---- |
| 5 | 1V to 4.5V | 10 |
| 6 | 0V | ---- |
| 7 | 1.3V | ---- |
| 8 | .07V | ---- |
| 9 | .08V | ---- |
| 10 | 1.3V | ---- |
| 11 | 0V | ---- |
| 12 | 1V to 4.5V | 11 |
| 13 | .9V | ---- |
| 14 | 1.7V to 3.1V | 9 |
| 15 | 0V | ---- |
| 16 | .15V | ---- |

| IC3 | | |
|-----|--------------|------|
| PIN | VOLTAGE | NOTE |
| 1 | .4V | ---- |
| 2 | 5.2V | ---- |
| 3 | 2.2V to 2.9V | 1 |
| 4 | .9V to 1.7V | 1 |
| 5 | 1.7V to 3.7V | 2 |
| 6 | 0V | ---- |
| 7 | 1.4V | ---- |
| 8 | 0V | ---- |
| 9 | .15V | ---- |
| 10 | 4.7V | ---- |
| 11 | 5.2V | ---- |
| 12 | 1.1V to 3.5V | 6 |
| 13 | 1.4V | ---- |
| 14 | 1.9V to 3.3V | 3 |
| 15 | 0V | ---- |
| 16 | .15V | ---- |

| IC4 | | |
|-----|--------------|------|
| PIN | VOLTAGE | NOTE |
| 1 | .4V | ---- |
| 2 | 5.2V | ---- |
| 3 | 2.1V to 3.8V | 12 |
| 4 | 2.2V | ---- |
| 5 | 1V to 4.5V | 10 |
| 6 | 0V | ---- |
| 7 | 1.4V | ---- |
| 8 | .07V | ---- |
| 9 | .08V | ---- |
| 10 | 1.1V | ---- |
| 11 | .2V | ---- |
| 12 | 1V to 4.5V | 11 |
| 13 | .8V | ---- |
| 14 | 1.5V to 3.1V | 13 |
| 15 | 0V | ---- |
| 16 | .15V | ---- |

| IC5 | | |
|-----|--------------|------|
| PIN | VOLTAGE | NOTE |
| 1 | 5.2V | ---- |
| 2 | 1.3V to 5.2V | 14 |
| 3 | .4V | ---- |
| 4 | .15V | ---- |
| 5 | 1.4V | ---- |
| 6 | .03V | ---- |
| 7 | .07V | ---- |
| 8 | .08V | ---- |
| 9 | .08V | ---- |
| 10 | .15V | ---- |
| 11 | 0V | ---- |
| 12 | .6V to 4.4V | 1 |
| 13 | .6V to 4.4V | 1 |
| 14 | .2V to 5.1V | 1 |
| 15 | 5.2V | ---- |
| 16 | 0V | ---- |

| IC6 | | |
|-----|-------------|------|
| PIN | VOLTAGE | NOTE |
| 1 | 3V to 5.2V | 15 |
| 2 | .6V to 4.4V | 1 |
| 3 | .03V | ---- |
| 4 | 2V | ---- |
| 5 | 4.6V | ---- |
| 6 | 1.3V | ---- |
| 7 | 1.4V | ---- |
| 8 | 1.4V | ---- |
| 9 | 1.4V | ---- |
| 10 | 0V | ---- |
| 11 | .15V | ---- |
| 12 | 2.2V | ---- |
| 13 | 3V to 4.6V | 16 |
| 14 | 2.8V | ---- |
| 15 | .7V | ---- |
| 16 | .4V | ---- |

| TRANSISTOR | | VOLTAGE | NOTE |
|------------|---|------------|------|
| Q4 | E | 0V | ---- |
| | B | .3V to .7V | 1 |
| | C | 0V to 5.2V | 1 |
| Q5 | E | 8.0V | ---- |
| | B | 8.0V | ---- |
| | C | 0V to 3.7V | 1 |
| Q6 | E | 0V | ---- |
| | B | .08V | ---- |
| | C | 5.1V | ---- |
| Q7 | E | 0V | ---- |
| | B | .65V | ---- |
| | C | .15V | ---- |
| Q9 | E | 5.2V | ---- |
| | B | 6.0V | ---- |
| | C | 9.0V | ---- |

NOTES:

VOLTAGES TAKEN WITH VTVM, GAME SWITCH IN "B" POSITION (TENNIS), PLAYERS SWITCH IN "4", SOUND ON, PLAYERS ENTERED AND "BALL" VOLLEYING BETWEEN.

VOLTAGE VARIES WITH BALL SPEED & DISTANCE TRAVELED.
 VOLTAGE VARIES WITH RIGHT OR LEFT BALL CONTROL.
 VOLTAGE VARIES WITH LEFT WALL POSITION CONTROL.
 VOLTAGE VARIES WITH LOWER REBOUND CONTROL.
 VOLTAGE VARIES WITH UPPER REBOUND CONTROL.
 VOLTAGE VARIES WITH GOAL POSITION CONTROL.
 VOLTAGE VARIES WITH RIGHT WALL POSITION CONTROL.
 VOLTAGE VARIES WITH RIGHT PLAYER HORIZONTAL POSITION.

9. VOLTAGE VARIES WITH LEFT PLAYER HORIZONTAL POSITION.
 10. VOLTAGE VARIES WITH RIGHT PLAYER VERTICAL POSITION.
 11. VOLTAGE VARIES WITH LEFT PLAYER VERTICAL POSITION.
 12. VOLTAGE VARIES WITH RIGHT FIXED PLAYER POSITION.
 13. VOLTAGE VARIES WITH LEFT FIXED PLAYER POSITION.
 14. VOLTAGE VARIES WITH BLANKING CENTERING & WIDTH.
 15. VOLTAGE VARIES WITH HORIZONTAL SCORE POSITION.
 16. VOLTAGE VARIES WITH VERTICAL SCORE POSITION.

IC BASIC FUNCTIONS

IC1

- A. Voltage Regulator
- B. Vertical Sync Generator
- C. Horizontal Sync Generator
- D. Right Wall Generator
- E. Rebound Circuitry

IC2

- A. Right Player Generator
- B. Left Player Generator

IC3

- A. Left Wall Generator
- B. Ball Generator

IC4*

- A. Right Back Court Player Generator
- B. Left Back Court Player Generator

IC5

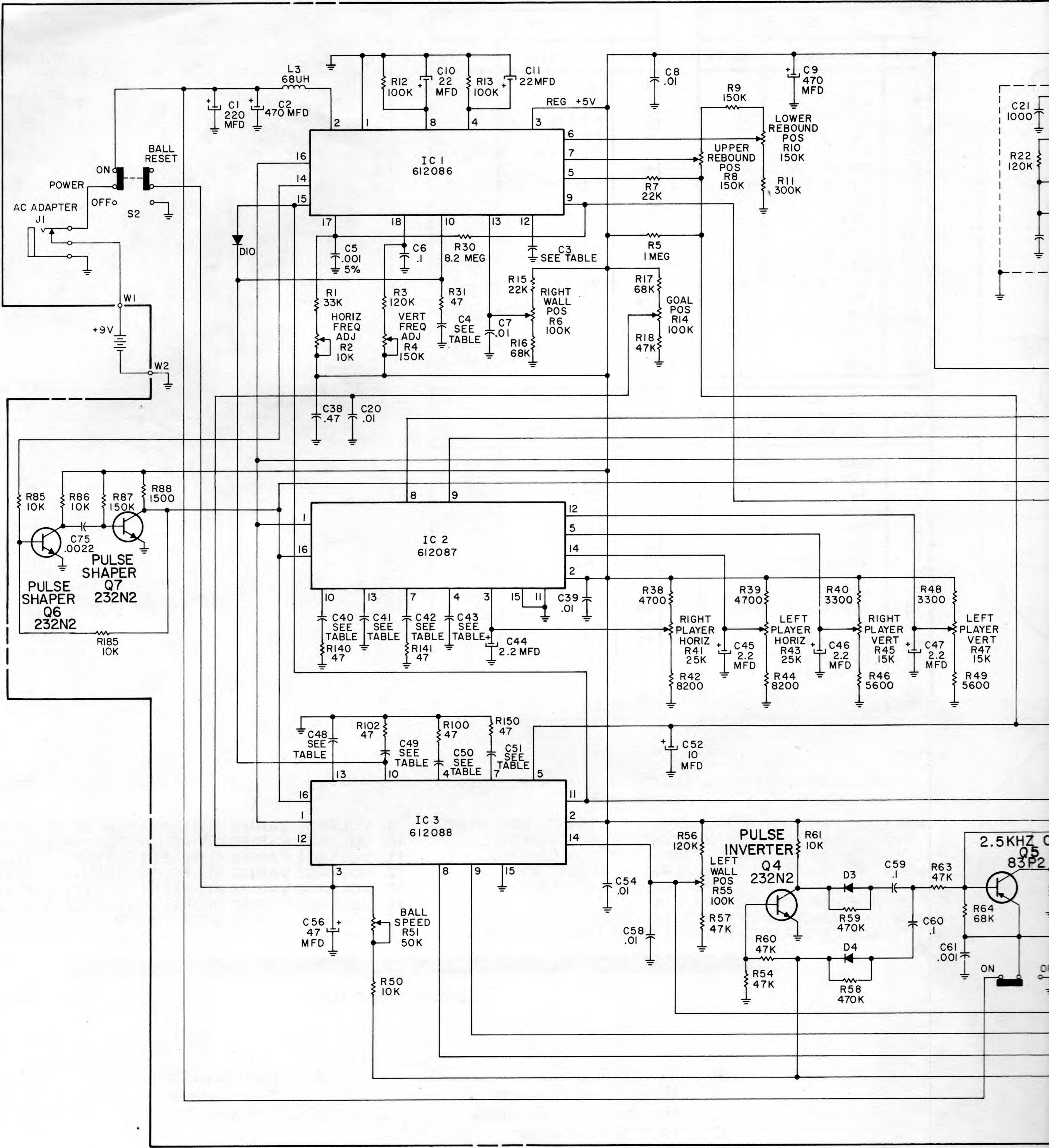
- A. Video Summer
- B. Video Output
- C. Audio Pulse Generator
- D. Logic Circuitry

IC6*

- A. Automatic Scoring Circuitry

* Not used in YF7010

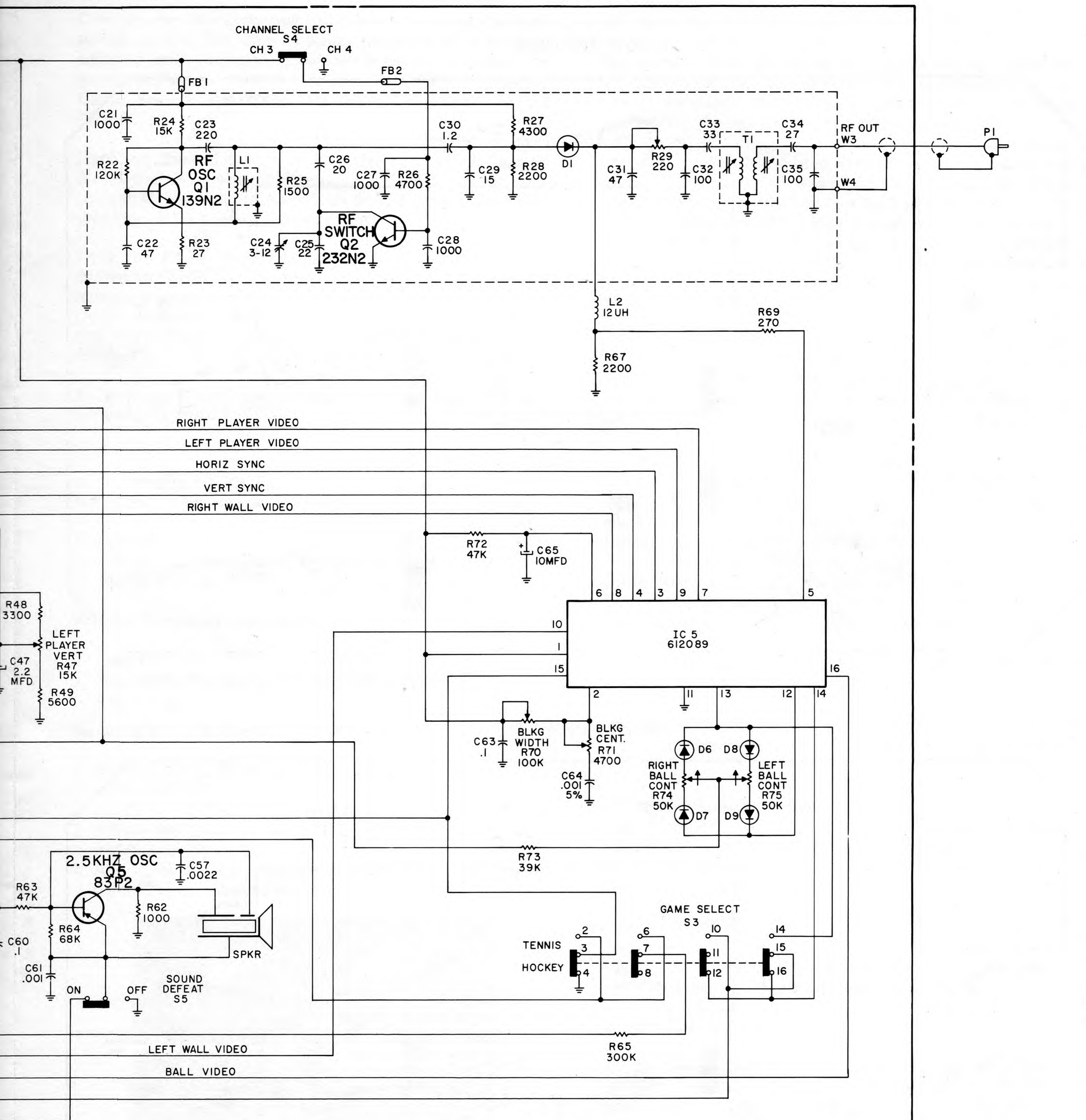
YF7010 SCHEMATIC DIAGRA



| | TIMING CAPACITORS | GROUP 1 IC'S | GROUP 2 IC'S | GROUP 3 IC'S | GROUP 4 IC'S |
|-------|--------------------------|--------------|---------------------------------|--------------|--------------|
| HORIZ | C3, C41, C43, C48, & C50 | .0022 MFD | .0027 MFD EXCEPT C3 = .0022 MFD | .0018 MFD | .0027 MFD |
| VERT | C4, C40, C42, C49, & C51 | .47 MFD | .56 MFD | .39 MFD | .68 MFD |

NOTES:
UNLESS OTHERWISE SPECIFIED
1. CAPACITANCE IN PICO FARADS
2. CAPACITANCE IN MICRO FARADS
3. RESISTORS IN OHMS

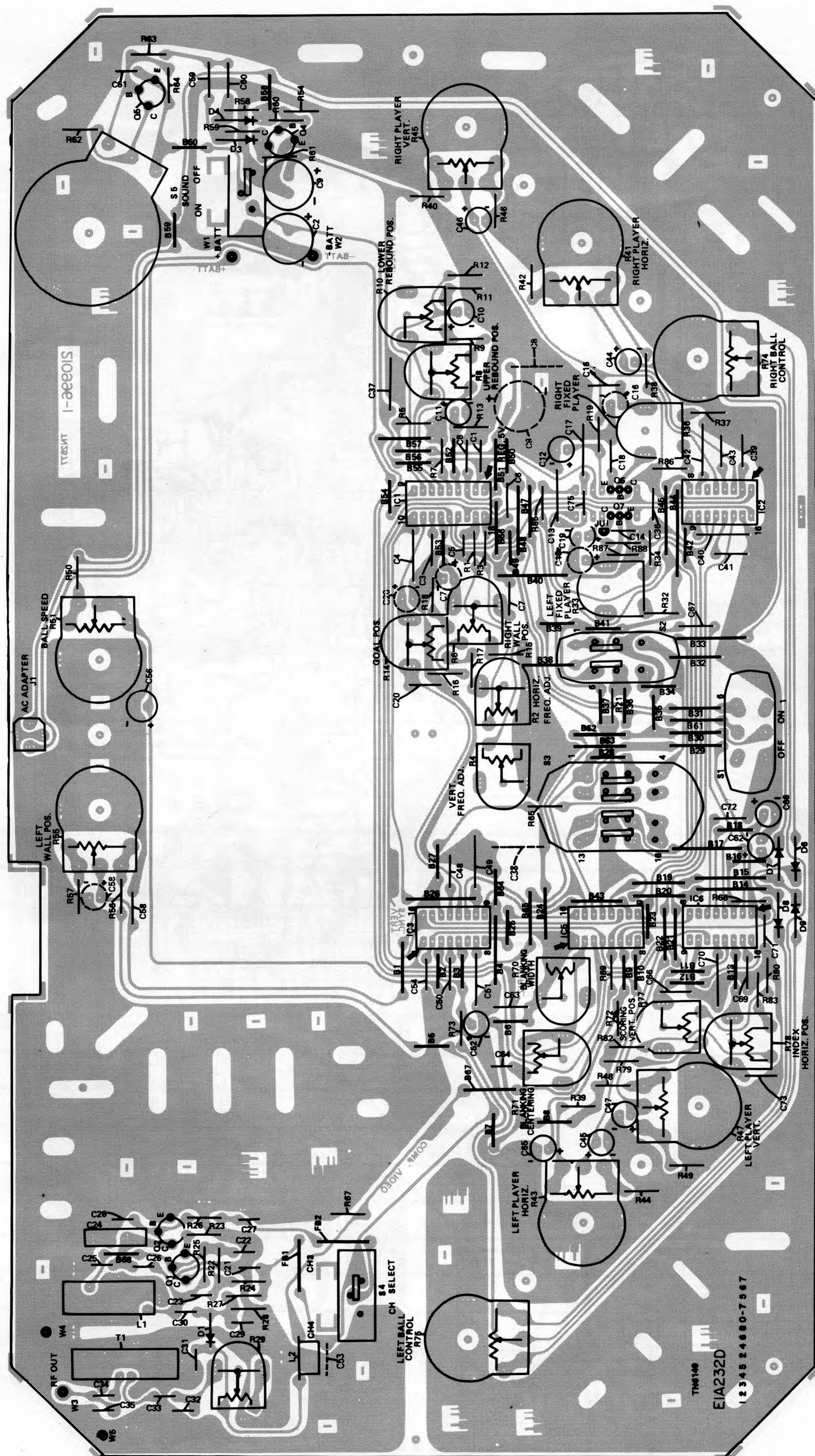
SCHEMATIC DIAGRAM

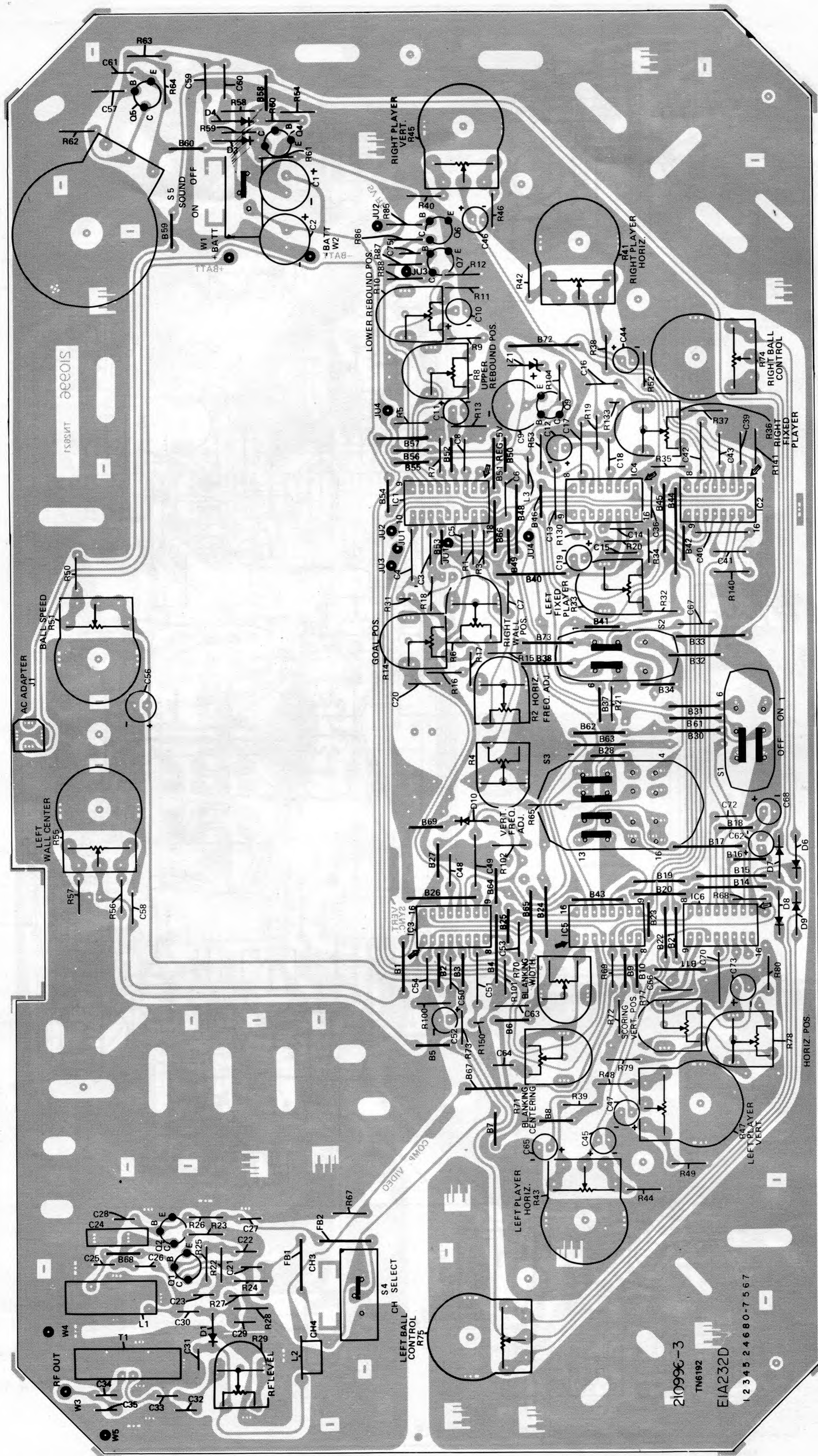


NOTES:

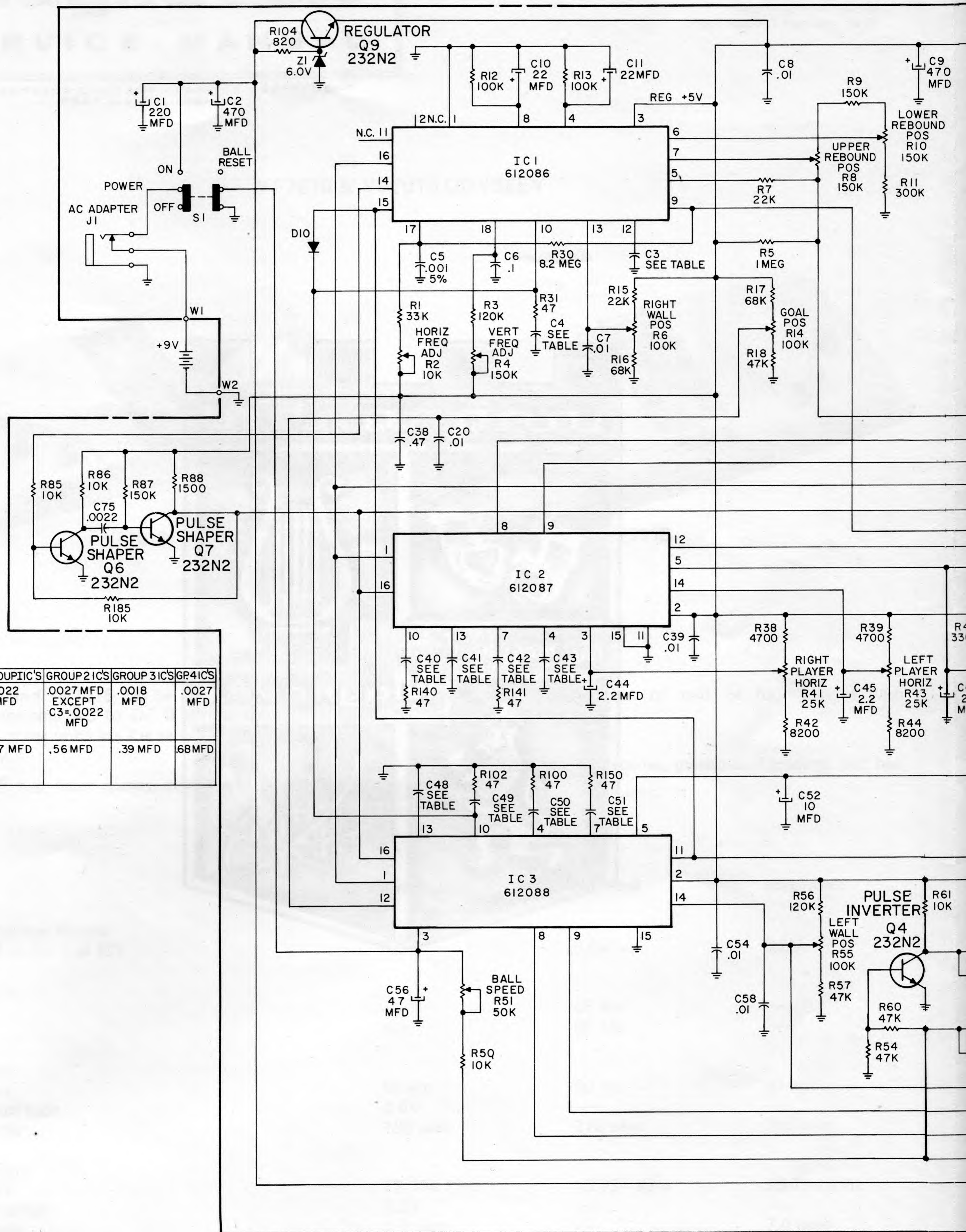
UNLESS OTHERWISE SPECIFIED:

1. CAPACITANCE VALUES OF 1 OR GREATER ARE IN PICOFARADS.
2. CAPACITANCE VALUES OF LESS THAN 1 ARE IN MICROFARADS.
3. RESISTORS ARE 1/4 WATT, 10 %.

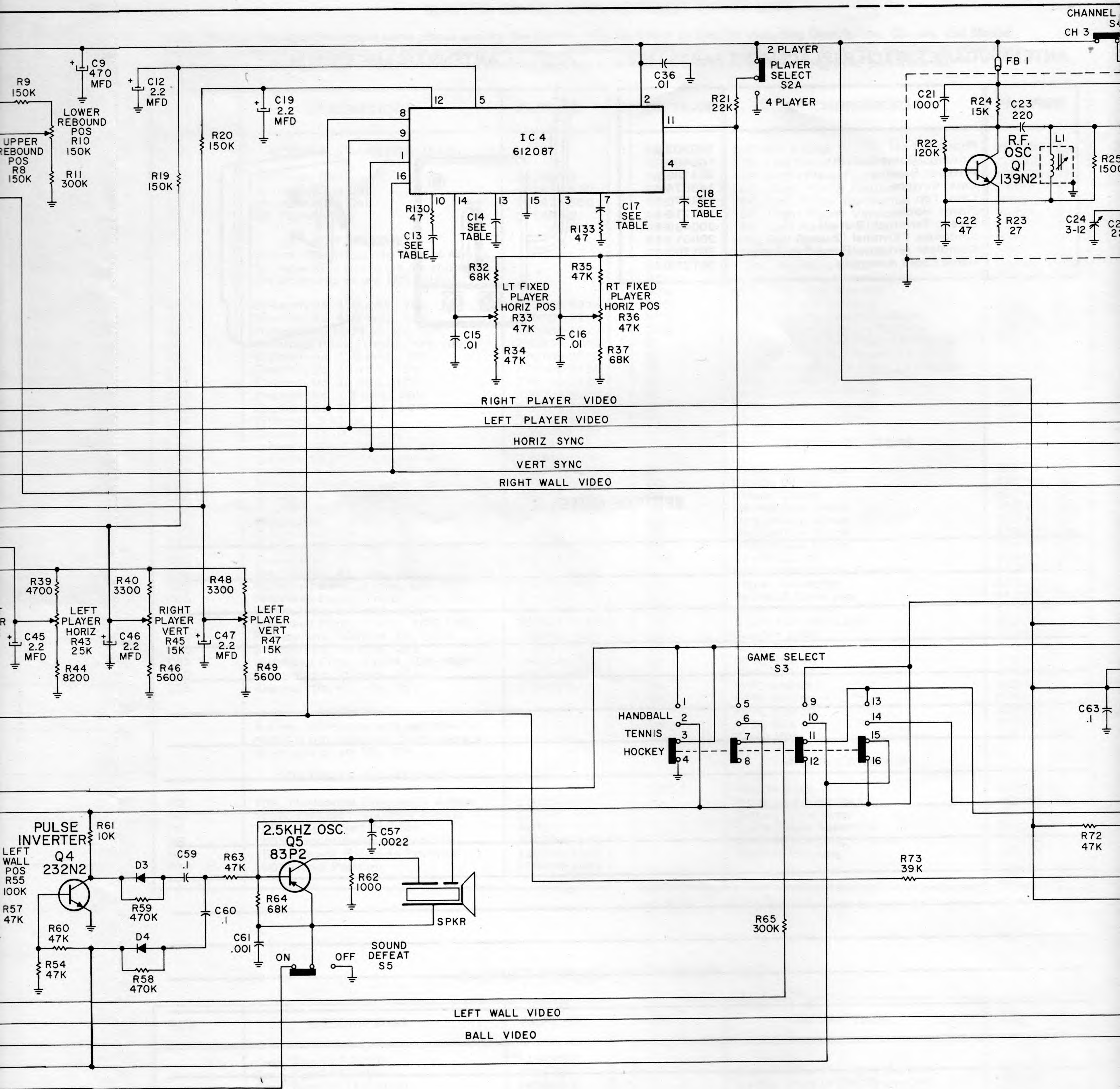




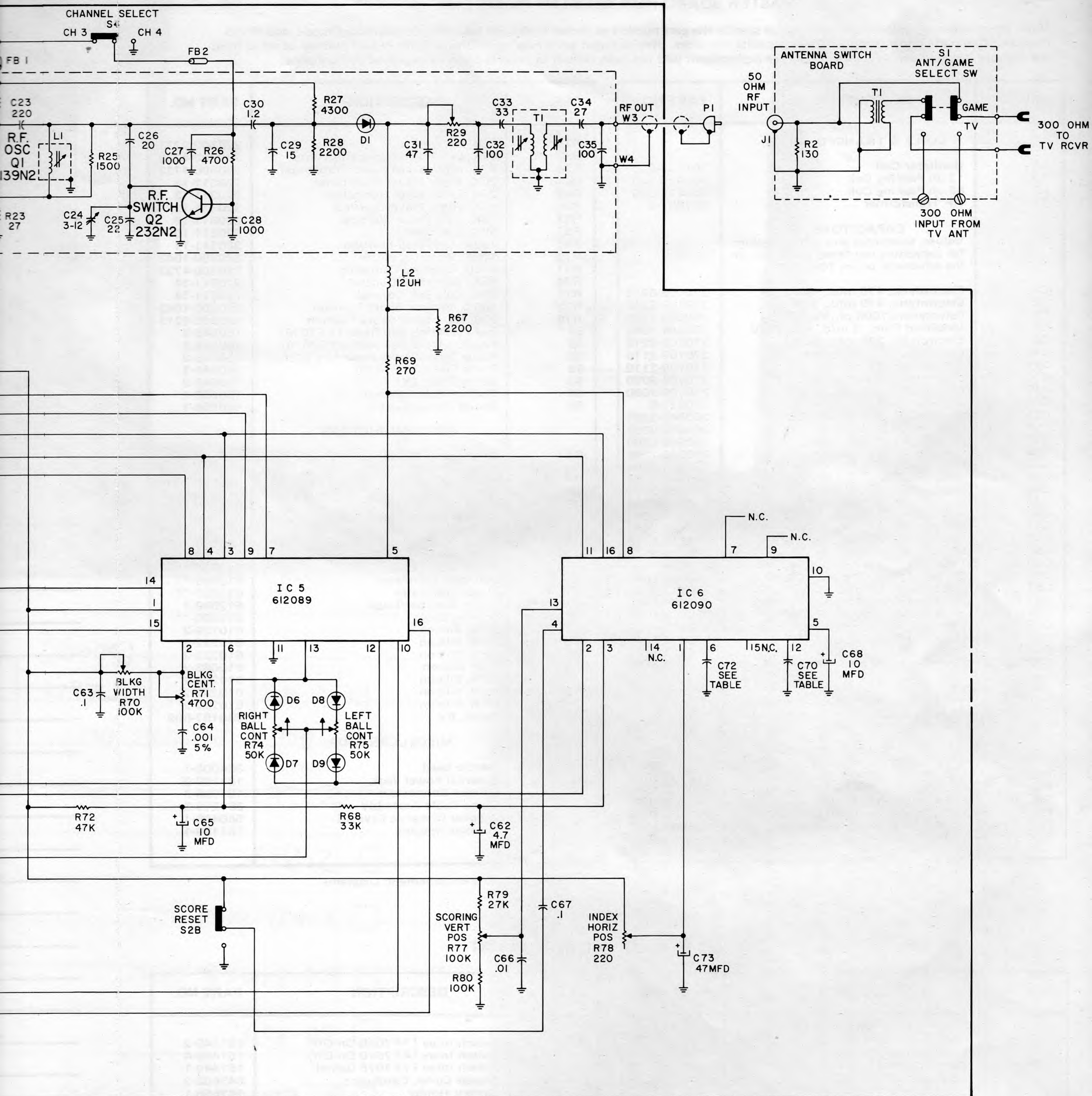
| | TIMING CAPACITORS | GROUP 1 IC'S | GROUP 2 IC'S | GROUP 3 IC'S | GROUP 4 IC'S |
|-----------------------|--|--------------|--|--------------|--------------|
| H O R I Z | C3, C14, C18, C41, C43, C48, C50, & C72. | .0022 MFD | .0027 MFD EXCEPT C3=.0022 MFD | .0018 MFD | .0027 MFD |
| V E R T | C4, C13, C17, C40, C42, C49 C51 & C70 | .47 MFD | .56 MFD | .39 MFD | .68 MFD |



YF7015 SCHEMATIC DIAGRAM



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. CAPACITANCE VALUES OF 1 OR GREATER ARE IN PICO FARADS.
2. CAPACITANCE VALUES OF LESS THAN 1 ARE IN MICRO FARADS.
3. RESISTORS ARE 1/4 WATT, 10 %.



MASTER BOARD REPLACEMENT PARTS LIST

Note: When ordering replacement parts please specify the part number as shown in this list including Description, Chassis, and Model Number. Complete information will help expedite the order. Replacement parts may occasionally differ in part number or value from the Factory installed part. In either event the replacement part has been chosen to provide equal or improved performance.

| REF. | DESCRIPTION | PART NO. |
|------|---|-------------|
| | COILS & TRANSFORMERS | |
| L1 | Oscillator Coil | 361495-2 |
| L2 | 12 uh Peaking Coil | 361425-120 |
| L3 | 68 uh Peaking Coil | 361475-680 |
| T1 | RF Transformer | 361467-2 |
| | CAPACITORS | |
| | Values, tolerances and voltage ratings for capacitors not listed are shown on the schematic or are 10%, 500V. | |
| C1 | Electrolytic, 470 mfd., 16V | 270109-5215 |
| C2 | Electrolytic, 470 mfd., 16V | 270109-5215 |
| C5 | Polystyrene, 1000 pf., 5%, 150V | 250589-1025 |
| C6 | Metalized Film, .1 mfd., 10%, 100V | 250654-1049 |
| C9 | Electrolytic, 220 mfd., 16V | 270109-2215 |
| C10 | Electrolytic, 22 mfd., 10V | 270109-2110 |
| C11 | Electrolytic, 22 mfd., 10V | 270109-2110 |
| C12 | Electrolytic, 2.2 mfd., 50V | 270109-2050 |
| C19 | Electrolytic, 2.2 mfd., 50V | 270109-2050 |
| C24 | Trimmer, 3-15 pf. | 250371-6 |
| C25 | Ceramic, 22 pf., 5%, 500V, NPO | 250546-2205 |
| C26 | Ceramic, 20 pf., 5%, 500V, NPO | 250546-2005 |
| C29 | Ceramic, 15 pf., 10%, 500V, NPO | 250546-1509 |
| C30 | Ceramic, 1.2 pf., 10%, 500V, NPO | 250546-1296 |
| C33 | Ceramic, 33 pf., 5%, 500V, NPO | 250546-3305 |
| C34 | Ceramic, 27 pf., 5%, 500V, NPO | 250546-2705 |
| C44 | Electrolytic, 2.2 mfd., 50V | 270109-2050 |
| C45 | Electrolytic, 2.2 mfd., 50V | 270109-2050 |
| C46 | Electrolytic, 2.2 mfd., 50V | 270109-2050 |
| C47 | Electrolytic, 2.2 mfd., 50V | 270109-2050 |
| C52 | Electrolytic, 10 mfd., 25V | 270111-1125 |
| C56 | Electrolytic, 47 mfd., 16V | 270111-5115 |
| C59 | Metalized Film, .1 mfd., 10%, 100V | 250654-1049 |
| C60 | Metalized Film, .1 mfd., 10%, 100V | 250654-1049 |
| C62 | Electrolytic, 4.7 mfd., 50V | 270111-5050 |
| C63 | Metalized Film, .1 mfd., 10%, 100V | 250654-1049 |
| C64 | Polystyrene, 1000 pf., 5%, 150V | 250589-1025 |
| C65 | Electrolytic, 10 mfd., 25V | 270111-1125 |
| C67 | Metalized Film, .1 mfd., 10%, 100V | 250654-1049 |
| C68 | Electrolytic, 10 mfd., 25V | 270111-1125 |
| C73 | Electrolytic, 47 mfd., 16V | 270109-5115 |
| | RESISTORS | |
| | Values, tolerances, and wattages for resistors not listed are shown on the schematic or are 5%, 1/4W. | |
| | CONTROLS & SWITCHES | |
| R2 | 10K, Horizontal Frequency Adjust | 220300-1032 |
| R4 | 150K, Vertical Frequency Adjust | 220300-1543 |
| R6 | 100K, Right Wall Position | 220300-1043 |
| R8 | 150K, Upper Rebound Position | 220300-1543 |
| R10 | 150K, Lower Rebound Position | 220300-1543 |
| R14 | 100K, Goal Position | 220300-1043 |

| REF. | DESCRIPTION | PART NO. |
|----------------|------------------------------------|-------------|
| R29 | 220, RF Adjust | 220300-2213 |
| R33 | 47K, Left Fixed Player Horizontal | 220300-4733 |
| R36 | 47K, Right Fixed Player Horizontal | 220300-4733 |
| R41 | 25K, Right Player Horizontal | 220311-13 |
| R43 | 25K, Left Player Horizontal | 220311-13 |
| R45 | 15K, Right Player Vertical | 220311-12 |
| R47 | 15K, Left Player Vertical | 220311-12 |
| R51 | 50K, Ball Speed | 220311-10 |
| R55 | 100K, Left Wall Position | 220311-11 |
| R70 | 100K, Blanking Width | 220300-1043 |
| R71 | 4700, Blanking Centering | 220300-4723 |
| R74 | 50K, Right Ball Control | 220311-14 |
| R75 | 50K, Left Ball Control | 220311-14 |
| R77 | 100K, Vertical Score Position | 220300-1043 |
| R78 | 220, Horizontal Score Position | 220300-2213 |
| S1 | Pwr./On-Off & Ball Reset (YF7015) | 160546-3 |
| S2 | Pwr./On-Off & Ball Reset (YF7010) | 160546-3 |
| S2 | Player Select/Score Reset (YF7015) | 160546-3 |
| S3 | Game Select (YF7010) | 160546-1 |
| S3 | Game Select (YF7015) | 160546-2 |
| S4 | Channel Select Switch | 160556-1 |
| S5 | Sound Defeat Switch | 160556-1 |
| SEMICONDUCTORS | | |
| D1 | Germanium Diode | 530105-1001 |
| D3 | Silicon Diode | 530181-1001 |
| D4 | Silicon Diode | 530181-1001 |
| D6 | Germanium Diode | 530065-1002 |
| D7 | Germanium Diode | 530065-1002 |
| D8 | Germanium Diode | 530065-1002 |
| D9 | Germanium Diode | 530065-1002 |
| D10 | Silicon Diode | 530181-1001 |
| IC1 | Voltage Reg./Sync Generator | 612086-** |
| IC2 | Player Generator | 612087-** |
| IC3 | Ball/Wall Generator | 612088-** |
| IC4 | Player Generator | 612087-** |
| IC5 | Video Summer/Logic | 612089-1 |
| IC6 | Scoring Logic | 612090-** |
| Q1 | NPN, Silicon | 610139-2 |
| Q2 | NPN, Silicon | 610232-2 |
| Q4 | NPN, Silicon | 610232-2 |
| Q5 | PNP, Silicon | 610083-2 |
| Q6 | NPN, Silicon | 610232-2 |
| Q7 | NPN, Silicon | 610232-2 |
| Q9 | NPN, Silicon | 610232-2 |
| Z1 | Zener, 6V | 530157-609 |
| MISCELLANEOUS | | |
| FB1,2 | Ferrite Bead | 364005-1 |
| J1 | External Power Jack | 181139-2 |
| | Battery Connector | 181096-3 |
| | Game Cable Assembly | 361218-3 |
| | Speaker (Ceramic Crystal) | 560406-1 |
| | Speaker Housing | 181189-1 |

**** Refer to Charts on Schematic Diagrams**

CABINET REPLACEMENT PARTS LIST

| REF. | DESCRIPTION | PART NO. |
|------|---|----------|
| | Case, Top (YF7010) | 143670-2 |
| | Case, Top (YF7015) | 143670-1 |
| | Case, Bottom (YF7010) | 143669-2 |
| | Case, Bottom (YF7015) | 143369-1 |
| | Score Pointer (YF7010) | 143675-2 |
| | Score Pointer (YF7015) | 143675-1 |
| | Retainer, Score Pointer | 732937-1 |
| | Knob, Control (YF7010) | 143689-4 |
| | Knob, Control (YF7015) | 143689-3 |
| | Score Overlay (YF7010) | 151448-2 |
| | Score Overlay (YF7015) | 151448-1 |
| | Switch Inlay (YF7010 Game & YF7015 Players) | 151449-3 |

| REF. | DESCRIPTION | PART NO. |
|------|-------------------------------------|----------|
| | Switch Inlay (YF7015 On-Off) | 151449-2 |
| | Switch Inlay (YF7010 On-Off) | 151449-4 |
| | Switch Inlay (YF7015 Game) | 151449-1 |
| | Chassis Cover, Cardboard | 643602-2 |
| | Battery Holder | 142658-1 |
| | Foot, Black | 141737-3 |
| | Spring Lock Nut | 103235-1 |
| | Stud, Cover Holding | 732953-1 |
| | Cross Pin (for Stud) | 103236-1 |
| | Customer Operating Booklet (YF7010) | 1B2899-1 |
| | Customer Operating Booklet (RF7015) | 1B2900-2 |

